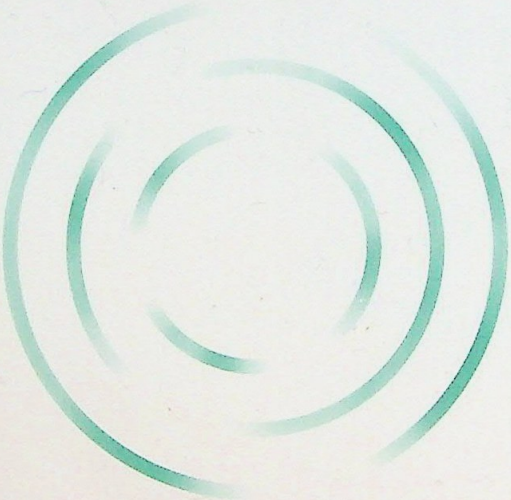
intel® *Software Development Tools*

MCS®-51 Utilities Pocket Reference for DOS Systems



122750-001

CONTENTS

Notational Conventions

`THIS TYPE`	Use these keywords, letters, symbols, and punctuation verbatim. Upper or lowercase is acceptable.
italics	Substitute language elements or constructs for true terms.
[ ]	Optional constructs.
[ ]...	Optional constructs that can be repeated any number of times.
[,...]	The preceding item may be repeated, but each repetition must be separated by a comma.
{ }	Alternate constructs. Choose any one of the constructs enclosed in the braces.
/*text enclosed*/	Text enclosed is a prose definition of the construct.

When two adjacent items must be concatenated, they appear with no space between them. A blank space between two items indicates that the two items may be separated by one or more blanks.

Definitions of Common Terms

Term	Definition
name	Names can be from 1 to 40 characters long and must be composed of letters (A-Z), digits (0-9), or special characters (?, @, _). The first character must be a letter or a special character.
module-name	Same as name.
segment-name	Same as name.
pathname	A valid filename reference or device reference. See next two items for examples.
filename	A reference to a disk file. The format is: *root* [.*ext*]
device	A reference to a non-disk device. Examples: :LP:, :CO:, :TO:.
value	A 16-bit unsigned integer. Examples: 1011B, 304Q, 4096D (or just 4096), 0C300H.
address	Same as value.

RL51 Command Format Summary

[*directory* | *device*] `RL51` *input-list* [`TO` *output-file*] [*control-list*]

where

[*directory* | *device*]
is the directory or device where RL51 resides.

input-list : ▪
input-file [*module-list*][,...]

input-file : ▪
filename

RL51 Command Format Summary (Cont'd.)

module-list : =

(*module-name* [,...])

output-file : =

filename

control-list : =

control ...

control : =

{ *listing-control*
linking-control
locating-control
configuration-control
overlay-control }

listing-control : =

{ *print*
pagewidth
map
symbols
publics
lines
ixref }

print : =

{ PRINT [(*pathname*)] }
{ NOPRINT }

pagewidth : =

PAGEWIDTH(*value*)

map : =

{ MAP }
{ NOMAP }

symbols : =

{ SYMBOLS }
{ NOSYMBOLS }

RL51 Command Format Summary (Cont'd.)

publics :=

{ PUBLICS | NOPUBLICS }

lines :=

{ LINES | NOLINES }

ixref :=

{ IXREF[*selection-list*] | NOIXREF }

selection-list :=

(*selection-item* [,...])

selection-item :=

{ *generated* | *libraries* }

generated :=

{ GENERATED | NOGENERATED }

libraries :=

{ LIBRARIES | NOLIBRARIES }

linking-control :=

{ NAME(*module-name*) | *debugsymbols* | *debuglines* | *debugpublics* }

debugsymbols :=

{ DEBUGSYMBOLS | NODEBUGSYMBOLS }

RL51 Command Format Summary (Cont'd.)

debuglines :=

```
{DEBUGLINES   }
{NODEBUGLINES }
```

debugpublics :=

```
{DEBUGPUBLICS   }
{NODEBUGPUBLICS }
```

locating-control :=

```
{PRECEDE}
{DATA   }
{BIT    }
{IDATA  } (segment[,...])
{STACK  }
{XDATA  }
{CODE   }
```

segment :=

segment-name [(*address*)]

configuration-control :=

ramsize

ramsize :=

RAMSIZE(*value*)

overlay-control :=

```
{OVERLAY[(overlay-unit[,...])]}
{NOOVERLAY                    }
```

overlay-unit :=

ov-module-name calls ov-module-name

ov-module-name :=

{*module-name*}

calls :=

> or]

Listing Controls

Control	Effect
PRINT [(*pathname*)]	Sends the listing file to the file or device specified by pathname.
NOPRINT	Suppresses the listing file; overrides any of the following listing controls.
PAGEWIDTH (*value*)	Specifies the maximum page width to be used.
MAP	Outputs memory map to link summary.
NOMAP	Suppresses memory map.
SYMBOLS	Outputs local symbols to symbol table.
NOSYMBOLS	Suppresses local symbols.
PUBLICS	Outputs public symbols to symbol table.
NOPUBLICS	Suppresses public symbols.
LINES	Outputs line numbers to symbol table (high-level language translators only).
NOLINES	Suppresses line numbers.
IXREF [(*selection-list*)]	Appends intermodule cross-reference report to print file.
NOIXREF	Suppresses the intermodule cross-reference report.

NOTE: The default for any control (except IXREF) is the positive form (PRINT, MAP, SYMBOLS, PUBLICS, and LINES).

Linking Controls

Control	Effect
NAME (*module-name*)	Specifies the name of the output module. If the NAME control is omitted, the output module name defaults to the name of the first input module processed.
DEBUGSYMBOLS	Copies local symbol information to output file.
NODEBUGSYMBOLS	Suppresses local symbols.
DEBUGPUBLICS	Copies public symbol information to output file.
NODEBUGPUBLICS	Suppresses public symbols.
DEBUGLINES	Copies line number information (high-level language translators only) to output file.
NODEBUGLINES	Suppresses line numbers.

NOTE: For all linking controls except NAME, the default is the positive form (DEBUGSYMBOLS, DEBUGPUBLICS, and DEBUGLINES).

Locating Controls

Control	Address Space	Address Range (Hex)	Segment Types (and Attributes)
PRECEDE	Register banks and bit-addressable space in on-chip data RAM	00H-2FH	DATA (UNIT-aligned); IDATA
BIT	Bit-addressable space in on-chip data RAM	00H-7FH (see note 1)	BIT; DATA; IDATA
DATA	Directly-addressable on-chip data RAM	00H-7FH	DATA (UNIT-aligned); IDATA
IDATA	Indirectly-addressable on-chip data RAM	00H-0FFH (see note 2)	IDATA
STACK	Same as IDATA (see note 3)	Same as IDATA	Same as IDATA
XDATA	External data RAM	0-0FFFFH	XDATA
CODE	Code memory	0-0FFFFH	CODE

Notes on Locating Controls

1. Bit addresses for non-BIT segments in the BIT control must be on byte boundaries; that is, they must be divisible by 8. (BIT-type segments can be aligned on bit boundaries.)
2. The range of addresses for the IDATA control is dependent on the target machine. The 8051 has 128 bytes (addresses 00H-7FH). See the RAMSIZE control in this context.
3. The STACK control specifies which segments are to be allocated uppermost in the IDATA space. The memory accessed starts after the highest on-chip RAM address occupied by any previously allocated segment, and continues to the top of the IDATA space.

NOTE

This control has no other effect on any segments.

The IDATA ?STACK segment, if it exists, is placed higher than segments that are mentioned in the STACK control.

Overlaying Controls

Control	Effect
OVERLAY (*overlay-units*)	Overlays data segments, based on the information in the module declarations and in the overlay units.
NOOVERLAY	Suppresses the overlaying of data segments.

Configuration Controls

Control	Effect
RAMSIZE (*value*)	Specifies the maximum amount of on-chip RAM that may be allocated for the user program.

Abbreviations for Command Words

Command Word	Abbreviation
BIT	BI
CODE	CO
DATA	DT
DEBUGLINES	DL
DEBUGPUBLICS	DP
DEBUGSYMBOLS	DS
GENERATED	GN
IDATA	ID
IXREF	IX
LIBRARIES	LB
LINES	LI
MAP	MA
NAME	NA
NODEBUGLINES	NODL
NODEBUGPUBLICS	NODP
NODEBUGSYMBOLS	NODS
NOGENERATED	NOGN
NOIXREF	NOIX
NOLIBRARIES	NOLB
NOLINES	NOLI
NOMAP	NOMA
NOOVERLAY	NOOL
NOPRINT	NOPR
NOPUBLICS	NOPL
NOSYMBOLS	NOSB
OVERLAY	OL
PAGEWIDTH	PW
PRECEDE	PC
PRINT	PR
PUBLICS	PL
RAMSIZE	RS
STACK	ST
SYMBOLS	SB
TO	TO
XDATA	XD

LIB51 Command Summary

Following is a summary of the commands used by the LIB51 librarian.

Command	Abbreviation	Description
ADD { *file* [(*module* [,...])] } [,...] TO *library_file*	A	Adds modules to a library
CREATE *library file*	C	Creates a library file
DELETE *library_file* (*module* [,...])	D	Deletes modules from a library
EXIT	E	Terminates session with LIB51
EXTRACT { *file* [(*module* [,...])] } [,...]TO *file*	X	Extracts modules from libraries
HELP	H	Displays syntax of LIB51 commands
LIST { *file* [(*module* [,...])] } [,...] [TO *file*] [PUBLICS]	L [P]	Lists modules contained in libraries and optionally lists all publics
REPLACE { *file* [(*module* [,...])] } [,...] IN *library_file*	R	Replaces modules in a library

3065 Bowers Avenue, Santa Clara, California 95051
(408) 987-8080

Printed in U.S.A.
A1653/286/4K/SVP/KH
MICROCONTROLLERS